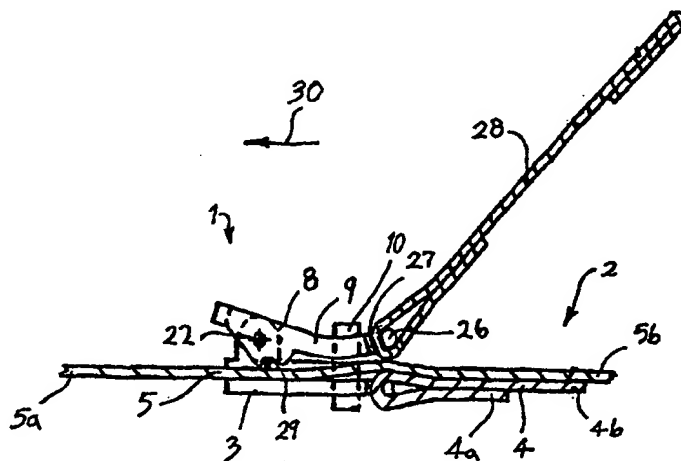


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(54) Title: A BUCKLE AND RETENTION SYSTEM INCLUDING SUCH A BUCKLE



(57) Abstract

A helmet buckle (1) for allowing length adjustment of a helmet chin strap (2) includes a longitudinally extending base member (3) for fixedly and slidably engaging a first and a second portion (4, 5) of strap (2). A locking member (8) is connected to member (3) for movement between a locked and released configuration to respectively allow and prevent locking engagement of portion (5) against member (3). A lever (9) extends from member (8) for facilitating movement of that member between the locked and released configuration. Moreover, locking means in the form of a resilient band (10) encircles member (3) and lever (9) to bias member (8) toward the locked configuration.

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Title: A BUCKLE AND RETENTION SYSTEM INCLUDING SUCH
A BUCKLE

TECHNICAL FIELD

The present invention relates to a buckle and a helmet retention system including such a buckle.

The invention has been developed primarily for use with bicycle helmets and will be described hereinafter with reference to that application. However, it will be appreciated that the invention is not limited to that particular field of use and is also suitable for retaining other helmets and/or wearing apparel to a wearer's head. For example, industrial safety helmets, motorcycle helmets, football helmets and the like.

BACKGROUND ART

Hitherto, bicycle helmets have generally included a chin strap having two portions which

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support at their respective free ends complementary buckle components which are selectively releasably intergaged to form the portions into a loop around the wearer's chin. In this way the helmet is retained on the wearer's head. Buckle components for effecting the joining of the two strap portions are well known to those skilled in the art of helmet design.

Known strap portions generally include some form of length adjustment to cater for different sized heads. This adjustment is cumbersome and requires the use of two hands and perhaps several iterations of removing and placing the helmet from and onto the intended wearer's head before the satisfactory strap length is achieved.

During subsequent use, the cyclist will be physically exerting themselves and their head will tend to swell and therefore make any initial snug fit uncomfortable. Alternatively, an initially loose fit will not maximise the protective properties of the helmet as a large amount of relative movement between the head and helmet will be possible. Consequently, both of these arrangements are unsatisfactory, as ideally the straps should form a reasonably tight fit around the wearer's chin at all times. Other longer term factors such as variation in the length of the

wearer's hair may also contribute to this problem.

The long adjustment process for existing helmets is a particular problem with those helmets intended for use by children. It is not uncommon to see the retention straps either too loose to be effective, or alternatively, the two buckle components left unengaged and providing additional opportunity to injure the wearer should an impact occur.

DISCLOSURE OF THE INVENTION

It is an object of the present invention, at least in its preferred embodiment, to overcome or substantially ameliorate at least one of these deficiencies of the prior art.

According to a first aspect of the invention there is provided a buckle for allowing length adjustment of a helmet chin strap, the buckle including:

- a longitudinally extending base member for fixedly and slidably engaging a first and second portion of the strap respectively;

- a locking member connected to the base member for movement between a locked and released configuration to respectively allow and prevent locking engagement of the second portion against the base member;

- a lever extending from the locking member for

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facilitating movement of the locking member between the locked and released configuration; and

locking means for biasing the locking member toward the locked configuration.

Preferably, the lever is moved toward and away from the base member to move said locking member between the locked and released configuration respectively. More preferably, the locking means includes a resilient band extending about the lever and the base member.

Preferably also, the first portion is fixedly connected at one end to the base member and locking engagement of the second portion occurs at a longitudinally spaced apart second end of the base member. More preferably, the locking member is hingedly connected to the base member adjacent the second end and includes a serrated jaw for engaging the second portion.

In a preferred form, the jaw is hinged about a transverse axis such that when in the locked configuration longitudinal urging of the second portion from the first to the second end further biases the jaw into locked engagement while longitudinal urging of the second portion in the opposite direction moves the jaw toward the release position and allows checked progression of the second portion along the base member.

Preferably, the free end of the lever includes a tab for facilitating hand operation of the buckle.

According to a second aspect of the invention there is provided a helmet retention system including a chin strap extending from opposite sides of the helmet, the strap including a first and a second portion, the system including a buckle having a longitudinally extending base member for fixedly and slidably engaging the first and second portions respectively, a locking member connected to the base member for movement between a locked and released configuration to respectively allow and prevent locking engagement of the second portion against the base member, a lever extending from the locking member for facilitating movement of the locking member between the locked and released configurations and locking means for biasing the locking member toward the locked configuration.

Preferably, the strap is retained to a first side of the helmet intermediate the first and second portions. More preferably, the strap is slidably retained to the first side of the helmet.

Preferably also, the chin strap is comprised of a single length of flexible webbing which extends from a first end which is retained to the base member, to the first side of the helmet, then back along its length to slidably engage the base member

and thereafter to a second end at the opposite side of the helmet.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a side view of a buckle according to a first aspect of the invention; and,

Figure 2 is a top view of the base member of Figure 1.

MODES FOR CARRYING OUT THE INVENTION

Referring to the drawings, a helmet buckle 1 for allowing length adjustment of a helmet chin strap 2 includes a longitudinally extending base member 3 for fixedly and slidably engaging a first and a second portion 4 and 5 respectively of strap 2. A locking member 8 is connected to member 3 for movement between a locked and released configuration to respectively allow and prevent locking engagement of portion 5 against member 3. A lever 9 extends from member 8 for facilitating movement of that member between the locked and released configuration. Moreover, locking means in the form of a resilient band 10 encircles member 3 and lever 9 to bias member 8 toward the locked configuration.

As best shown in Figure 2, member 3 includes four sides 11, 12, 13 and 14 which define a

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generally rectangular top surface 15. Adjacent and parallel to side 11 is a transversely extending aperture 16 through which portion 4 is inserted before being secured back along its own length by way of stitching, heat treating, or the like. Preferably, aperture 16 is only marginally wider than the strap which is to be inserted therethrough.

Extending upwardly from surface 15 and disposed on opposite sides 12 and 14 of member 3 are mounting formations 18 and 19 respectively. These formations are located adjacent side 13 and include coaxial apertures 20 and 21 for receiving complementary transversely extending studs 22 which protrude from opposite sides of locking member 8.

Member 3 also includes two opposed indents 23 and 24 respectively located along sides 12 and 14 for retaining band 10 in a fixed longitudinal disposition with respect to member 3.

Locking member 8 is mounted by way of studs 22 and apertures 20 and 21 to formations 18 and 19 for rotation about a generally transverse axis 25 which is spaced apart from surface 15. The associated lever 9 is curved and extends longitudinally away from member 8 toward side 11 and terminates at a free end 26. Lever 9 advantageously includes an aperture 27 adjacent end 26 for receiving a tab 28 which facilitate hand operation of buckle 1.

Member 8 also includes a serrated jaw 29 for effecting a secure engagement of portion 5 against surface 15, as required. As best shown in Figure 1, jaw 29 engages portion 5 intermediate the longitudinal spacing between axis 25 and aperture 16.

In use, buckle 1 is maintained in a locked configuration by way of band 10 resiliently biasing jaw 29 against portion 5 and subsequently against surface 15. Any additional longitudinal tension applied between the strap portions will result in jaw 29 being moved toward surface 15 and thereby more securely sandwiching portion 5 therebetween. Preferably, end 5a of portion 5 is fixed to one side of a helmet and end 5b is slidably secured to the other side of the helmet and thereafter being brought back along its length and joined to end 4b of portion 4. That is, once strap 2 has been tightened buckle 1 will resist any inadvertent removal of the helmet. However, should increased tension be required the user need only progress buckle 1 in the direction of arrow 30 and jaws 29 will be sufficiently progressed toward the released configuration to allow slidable movement of portion 5 along member 3. Once such progression is complete buckle 1 will automatically clamp the strap at the new position.

In order to release tension the wearer need

only grasp tab 28 between the thumb and finger and pull outwardly to overcome the bias of band 10. Subsequent movement of buckle 1 in either direction along portion 5 is then possible.

This single handed adjustment is able to be carried out both during initial placement of the helmet on the wearer's head and at any number of later times. Accordingly, if during use the wearer's head should swell due to exertion a quick and easy adjustment of the strap length can be effected with a single hand.

Although the invention has been described with reference to a specific example, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms.

CLAIMS:-

1. A buckle for allowing length adjustment of a helmet chin strap, the buckle including:

a longitudinally extending base member for fixedly and slidably engaging a first and second portion of the strap respectively;

a locking member connected to the base member for movement between a locked and released configuration to respectively allow and prevent locking engagement of the second portion against the base member;

a lever extending from the locking member for facilitating movement of the locking member between the locked and released configuration; and

locking means for biasing the locking member toward the locked configuration.

2. A buckle according to claim 1 wherein said lever is moved toward and away from the base member to move said locking member between the locked and released configuration respectively.

3. A buckle according to claim 1 or claim 2 wherein the locking means includes a resilient band extending about the lever and the base member.

4. A buckle according to any one of the preceding claims wherein the first portion is fixedly connected at one end to the base member and locking engagement of the second portion occurs at a

longitudinally spaced apart second end of the base member.

5. A buckle according to claim 4 wherein the locking member is hingedly connected to the base member adjacent the second end and includes a serrated jaw for engaging a second portion.

6. A buckle according to claim 5 wherein the jaw is hinged about a transverse axis such that when in the locked configuration longitudinal urging of the second portion from the first to the second end further biases the jaw into locked engagement while longitudinal urging of the second portion in the opposite direction moves the jaw toward the released position and allows checked progression of the second portion along the base member.

7. A buckle according to any one of the preceding claims wherein the free end of the lever includes a tab for facilitating hand operation of the buckle.

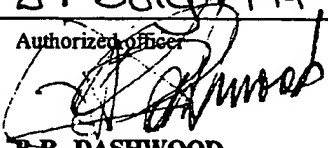
8. A helmet retention system including a chin strap extending from opposite sides of the helmet, the strap including a first and a second portion, the system including a buckle having a longitudinally extending base member for fixedly and slidably engaging the first and second portions respectively, a locking member connected to the base member for movement between a locked and released configuration to respectively allow and prevent

locking engagement of the second portion against the base member, a lever extending from the locking member for facilitating movement of the locking member between the locked and released configurations and locking means for biasing the locking member toward the lock configuration.

9. A system according to claim 8 wherein the strap is retained to a first side of the helmet intermediate the first and second portions.

10. A system according to claim 9 wherein the strap is slidably retained to the first side of the helmet.

11. A system according to any one of claims 8 to 10 wherein the chin strap is comprised of a single length of flexible webbing which extends from a first end which is retained to the base member, to the first side of the helmet, then back along its length to slidably engage the base member and thereafter to a second end at the opposite side of the helmet.

A. CLASSIFICATION OF SUBJECT MATTER Int. Cl. ⁵ A44B 11/12 According to International Patent Classification (IPC) or to both national classification and IPC					
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC A44B 11/12 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC as above Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)					
C. DOCUMENTS CONSIDERED TO BE RELEVANT					
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.			
X	AU,B, 14446/70 (436833) (AEROQUIP A.G.) 4 November 1971 (04.11.71) See Figs 1-3	1-11			
X	WO,A, 82/00849 (SWENSSON) 18 March 1982 (18.03.82) See Fig 1	1-11			
X	NL,A, 7506705 (INDUSTRIAL MOULDINGS B.V.) 7 December 1976 (07.12.76) See Figure	1-11			
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.					
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> * Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 33%; vertical-align: top;"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family </td> <td style="width: 33%;"></td> </tr> </table>			* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family	
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Date of the actual completion of the international search 1 July 1994 (01.07.94)		Date of mailing of the international search report 27 July 1994 (27.07.94)			
Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No. 06 2853929		Authorized officer  B.R. DASHWOOD Telephone No. (06) 2832121			

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X	FR,A, 2537410 (MOOCK) 15 June 1984 (15.06.84) See Fig 1, 2	1-11